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CLAIMS:

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- 1. An optical system comprising an optical element arranged on an optical axis in the path of a radiation beam, the optical element (2; 116; 202) comprising a birefringent material, the optical element having a non-planar face (4) through which the radiation beam passes, wherein the optical system comprises a polarisation control system for controlling polarisation of the radiation beam such that the radiation beam has a polarisation which is non-uniform across a cross section (21; 24) taken perpendicular to the optical axis, the non-uniform polarisation having a distribution corresponding with a shape of the said non-planar face.
- 2. An optical system according to claim 1, wherein, in a plurality of sectors (22) of the said cross section, the polarisation of the beam has a substantially tangential polarisation, which is aligned in a different direction in at least some of said sectors (22).
 - 3. An optical system according to claim 1, wherein, in a plurality of sectors (26) of the said cross section, the polarisation of the beam has a substantially radial polarisation, which is aligned in a different direction in at least some of said sectors (26).
 - 4. An optical system according to claim 2 or 3, wherein the shape of the said non-planar face is rotationally symmetric about the optical axis (OA).

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- 5. An optical system according to any preceding claim, wherein the optical system comprises an optic axis (AB) which is substantially parallel the optical axis (OA).
- An optical system according to any preceding claim, wherein the polarisation
 control system comprises a first polarising element (54; 254) comprising a plurality of
 different sections (55), wherein each section is arranged to differently modify a polarisation of the radiation beam.

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- 7. An optical system according to claim 4, wherein the first polarising element comprises at least four sections arranged in sectors about said optical axis.
- 8. An optical system according to any preceding claim, wherein the polarisation
 5 control system comprises an array of liquid crystal elements, wherein the liquid crystal elements have a configuration of different radial and/or axial orientations.
 - 9. An optical system according to any preceding claim, in which the polarisation control system comprises a polarising system arranged to change an initial, substantially uniform polarisation of the radiation beam to the said non-uniform polarisation.
 - 10. An optical system according to claim 7, wherein the initial polarisation is a linear polarisation.
- 15 11. An optical system according to claim 7, wherein the initial polarisation is a circular polarisation and the polarisation control system comprises:
 - a first polarising element (54; 254) arranged to change said circular polarisation to an intermediate polarisation, and
- a second polarising element (56; 256) arranged to change said intermediate 20 polarisation to said non-uniform polarisation.
 - 12. An optical system according to claim 9, wherein the second polarising element is a grating.
- 25 13. An optical system according to any preceding claim, wherein the optical system comprises a phase modification element (99; 299), said phase modification element being arranged to introduce a phase modification into the radiation beam.
- 14. An optical system according to claim 12, wherein the radiation beam is of30 substantially one wavelength and the phase modification is substantially one phase cycle of the wavelength.
 - 15. An optical system according to any preceding claim, wherein the radiation beam is an ultraviolet radiation beam.

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- 16. An optical system according to any preceding claim, wherein the optical element is a lens element.
- 5 17. An optical scanning device for scanning an optical record carrier, said optical scanning device comprising an optical system according to any preceding claim.